UNITED STATES PATENT AND TRADEMARK OFFICE

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10/586,283	11/06/2006	Kassem Ghorayeb	94.0052	3037

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SCHLUMBERGER INFORMATION SOLUTIONS
5599 SAN FELIPE
SUITE 1700
HOUSTON, TX 77056-2722

EXAMINER
ALHIJA, SAIF A

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 April 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 6-8* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 6-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 July 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1-4 and 6-8 have been presented for examination.

Claim 5 has been cancelled.

Claims 6-8 are newly presented.

Response to Arguments

2.   A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e),

was filed in this application after final rejection. Since this application is eligible for continued examination under

37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action

has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6 April 2010 has been entered.

PRIOR ART ARGUMENTS

i)   Following Applicants amendments the previous rejection is withdrawn in view of the 103

rejection presented below.

PRIORITY

3.   Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). Priority date
is 23 November 2002.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set

forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth
> in section 102 of this title, if the differences between the subject matter sought to be patented and the prior
> art are such that the subject matter as a whole would have been obvious at the time the invention was made
> to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be
> negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are

applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as

follows:

> 1.   Determining the scope and contents of the prior art.
> 2.   Ascertaining the differences between the prior art and the claims at issue.
> 3.   Resolving the level of ordinary skill in the pertinent art.
> 4.   Considering objective evidence present in the application indicating obviousness or
>   nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4.   **Claim(s) 1-4 and 6-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Haugen et al.**

"Simulation of Independent Reservoirs Coupled by Global Production and Injection Constraints", hereafter

H in view of **Briens et al. "Application of Sequential Staging of Tasks to Petroleum Reservoir Modeling",**

hereafter B further in view of **Watts U.S. Patent No. 6108608, hereafter W** further in view of **Scott et al.**

"Application of Parallel (MIMD) Computers to Reservoir Simulation", hereafter Scott.

Regarding Claim 1:

H discloses A method of controlling the coupling of multiplatform reservoir and network simulators

comprising:

initiating a first reservoir simulation for one or more physical parameters of a first reservoir in a first

reservoir simulator, the first reservoir simulation using a first fluid model; **(H. "An oil or gas field may comprise a**

number of isolated reservoir units, each of which may have been studied separately with their own simulation

models" as well as "The individual simulation models are still run as separate processes...")

initiating a second reservoir simulation for the one or more physical parameters in a second reservoir in a

second reservoir simulator, the second reservoir simulation using a second fluid model; **(H. "An oil or gas field**

may comprise a number of isolated reservoir units, each of which may have been studied separately with

their own simulation models" as well as "The individual simulation models are still run as separate

processes...")

H does not disclose however B discloses, excluding the first and second reservoir aspect which is

recited in H above, applying synchronization steps to the advancement through time of the first reservoir simulation

executing on a first computing device and the second reservoir simulation executing on a second computing device

(B. Page 431, left column, second to last paragraph, "synchronization of parallel events")

performing a production operation based on the first reservoir simulation of the first reservoir simulator and

the second reservoir simulation of the second reservoir simulator the first reservoir simulator performed on the first

computing device and the second simulation performed on the second computing device using the converted

hydrocarbon fluid streams. **(B. Page 428, top right, production rates. Equation 1) (B. Introduction, paragraph**

1, hydrocarbon and non-hydrocarbon components)

      B does not disclose translating each of first hydrocarbon fluid stream of the first reservoir simulation and a

second hydrocarbon fluid stream of the second reservoir simulation to a common fluid model of a controller by

converting pseudo components of each of the first hydrocarbon fluid stream and the second hydrocarbon fluid

stream to a super set of pseudocomponents used in the first reservoir simulator and the second reservoir simulator.

      However W discloses, excluding the first and second reservoir aspect which is recited in H above,

translating each of a plurality of hydrocarbon fluid streams to a common fluid model of a controller by converting

pseudo components of each of the plurality of hydrocarbon fluid streams to a super set of pseudocomponents used in

the reservoir and network simulators executing on a computer. **(W. Abstract)**

      H, B, and W do not explicitly recite however Scott recites providing an open message-passing interface

capable of **(The Examiner notes that "capable of" does not represent a patentable limitation since a mere**

capability is not an explicit limitation. Applicants correction is suggested) communicating with black oil model

reservoir simulations, compositional model reservoir simulations, and different types of surface networks; **(Scott.**

Figure 3, message passing)

      each synchronization step enabling different simulation tasks to take non-identical time steps, wherein each

simulation task of the first reservoir simulation and the second reservoir simulation advances independently to the

next synchronization step using corresponding time steps and Newton iterations uniquely suited to the individual

simulation task; **(Scott. Page 4, Forming Matrix Coefficients, including the Newton-Raphson iteration as well**

as using both black oil and compositional simulators as well as page 2 Parallel computing for the

synchronization aspect)

      It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the

pseudocomponent aspect of multi component fluid flow as discussed in W for the multiple independent

reservoir simulation of H as well as the synchronization and production operation in parallel simulation of B

since first the pseudocomponent aspect of W is "particularly useful in estimating properties and/or behavior

of fluids contained in hydrocarbon-bearing, subterranean formations or in hydrocarbon processing

facilities." (W. Column 1, Lines 13-16) and further the synchronization and production operations of B

through parallel processing result in a substantial decrease in processing time as well as promoting good load

balancing for the simulation. (B. Page 432, Conclusions) It would further have been obvious to utilize the

message passing and synchronization aspects of Scott with the simulation of H, B, and W since Scott describes

a faster and increased quality method of simulation utilizing parallel computing, (Scott Introduction,

Paragraph 1)

Regarding Claim 2:

        See rejection of claim 1.

Regarding Claim 3:

        The reference discloses The controller of claim 2 additionally comprising means for balancing the coupled

multiplatform reservoir simulators including means for apportioning global production and injection rates between

simulation tasks of the first reservoir simulator and the second reservoir simulator. **(B. Page 428, top right,**

production/injection) (H. "But they are coupled to a master process which handles the global production and

injection constraints...")

Regarding Claim 4:

        The reference discloses The controller of claim 3 additionally comprising means for balancing the coupled

multiplatform reservoir simulators and surface networks including balancing the surface network with the global

production and injection rates apportioned between the simulation tasks of the first reservoir simulator and the

second reservoir simulator. **(B. Introduction, paragraph 2, flow/material balancing. Page 432, left column, last**

two paragraphs, load balancing)

Regarding Claim 6:

The reference discloses The controller of claim 2, wherein the means for initiating the first reservoir simulation initiates a first reservoir simulation that comprises a black oil model in the first reservoir simulator and the means for initiating the second reservoir simulation initiates a second reservoir simulation that comprises a compositional model in the second reservoir simulator. **(Scott. Page 4, Forming Matrix Coefficients, both black oil and compositional simulators)**

Regarding Claim 7:

The reference discloses The controller of claim 2, further comprising means for coupling additional multi-platform reservoir simulators in addition to the first reservoir simulator and the second reservoir simulator, wherein the additional multi-platform reservoir simulators run a mixture of black oil models with different sets of active phases and compositional models with different sets of pseudo-components. **(Phases can be seen in Scott, Abstract, multiphase case using black oil and compositional fluid models and the pseudo component aspect is taught in W and cited above)**

Regarding Claim 8:

The reference discloses The controller of claim 2, wherein the first reservoir simulator and the second reservoir simulator run on different computer platforms. **(Scott, Abstract, Parallel computers)**

Conclusion

6.   All Claims are rejected.

7.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to SAIF A. ALHIJA whose telephone number is (571)272-8635. The examiner can normally be reached on M-F, 11:00-7:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571) 272-22792279. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. *Informal or draft communication, please label PROPOSED or DRAFT,* can be additionally sent to the Examiners fax phone number, (571) 273-8635.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SAA   /Kamini S Shah/
                                                       Supervisory Patent Examiner, Art Unit 2128

April 20, 2010